

CLAIMS

What is claimed is:

1. A modular heat-radiation structure comprising:

- a printed circuit board;
- a module for generating heat, including a first main unit having a fixing hole and a lead for connecting to the printed circuit board;
- a heat-radiation fin, fixed to the top face of the first main unit, for radiating heat generated in the module;
- a resin-made and insulating heat shield inserted between the printed circuit board and the first main unit; and
- a fixing element for fixing the heat shield, the module, and the heat-radiation fin; wherein:
 - a lead hole for allowing the lead to pass therethrough and a first fixing hole for allowing the fixing element to pass therethrough are provided in the heat shield, and
 - a second fixing hole for allowing the fixing element to pass therethrough is provided in the printed circuit board.

2. A controller including the modular heat-radiation structure as recited in claim 1, comprising:

- a chip fixed onto the printed circuit board and mounted under the first main unit, wherein:
 - either a slit or a concave for inserting the chip is formed in the heat shield.

3. A controller including the modular heat-radiation structure as recited in claim 1, comprising:

- an electric power source as a source for driving the module; and
- a case, having a mouth for opening the top face of the module, for mounting the printed circuit board, the module, the electric power source, and the heat shield; wherein:

the case includes a separator for separating from the electric power source the heat-radiation fin and the module.

4. A controller as recited in claim 3, wherein the separator includes:

a first separator attached to the case so as to be arranged along a side face of the heat-radiation fin, and

a second separator, being approximately U-shaped, attached to the heat shield so as to be arranged contacting or closed to the first separator.

5. A controller as recited in claim 4, wherein:

the case is made of resin,

the mouth of the case is formed slightly larger than the first main unit, and

a head is provided closed to and facing the bottom face of the heat-radiation fin around the mouth of the case.

6. A controller including the modular heat-radiation structure as recited in claim 1, comprising:

a stack for generating heat, including a second main unit, whose lead is fixed to the printed circuit board, being rectangularly and vertically arranged;

a heat-radiation fin including a mouth for protruding the second main unit of the stack, and also including a fold; and

a clip for contacting the fold to the second main unit, having elasticity towards its open/close movement.

7. A controller including the modular heat-radiation structure as recited in claim 1, wherein the heat shield is provided with a mouth for allowing the second main unit of the stack to pass therethrough, and also with a protrusion for supporting the second main unit along the longitudinal orientation of the mouth.